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February 29, 2008

Mr. Kyrik Rombough  
South Dakota Department of  
Environmental and Natural Resources  
Joe Foss Building  
523 East Capitol  
Pierre, South Dakota 57501-3182

**RECEIVED**

**MAR 03 2008**

**AIR QUALITY  
PROGRAM**

Dear Kyrik:

Subject: Big Stone II, PSD Permit No. 28.0803-PSD

Otter Tail Power Company submits its comments on the draft Prevention of Significant Deterioration ("PSD") permit issued by the South Dakota Department of Environmental and Natural Resources ("SD DENR") public noticed on January 30, 2008.

Enclosed is some information regarding IGCC technology.

Also enclosed is the case-by case MACT analysis we submitted earlier this week.

We also note that there may be minor, insignificant differences in the specifications, dimensions or locations of equipment as it is built in the field versus how it was described in our permit application materials and other submissions. We request a provision in the permit stating that such deviations will not violate the permit or source obligation rule so long as modeling shows that the deviations will not result in a modeled exceedance of the National Ambient Air Quality Standard or PSD increment.

Sincerely,

Terry Graumann  
Manager, Environmental Services

Enclosure

Domestic and International IGCC Facilities

Information collected on current performance of IGCCs worldwide confirms that their demonstrated emissions are no lower than those for Big Stone II. Moreover, IGCC still has limited reliability and is not demonstrated for baseload use. Finally, IGCC is fundamentally different from conventional coal technology and would redefine the source.

Review of a 2007 National Energy Technology Laboratory (NETL) Report<sup>1</sup> indicates that there are 13 electricity generating IGCC facilities worldwide (not including the two located in the United States). Attachment 1 lists the 13 electricity generating facilities outside of the United States. Most of those units do not operate on coal and/or do not supply baseload power. To our knowledge, there are only four coal-based IGCC facilities in the world that sell electricity to the power grid: Polk Power Station in Florida, Wabash River Power Station in Indiana, Buggenum IGCC in the Netherlands and Puertollano IGCC in Spain. Of those four power stations, two burn petcoke as a supplemental, if not, primary fuel. It is unclear whether any of the four power stations burn primarily coal. Table 1 of Attachment 1 shows detailed operational information from the two coal-based IGCC facilities outside of the United States that sell electricity to the grid.

To learn more about the IGCC units in other parts of the world, Otter Tail conducted internet research. That research regarding the international IGCC units resulted in us reaching the same the same conclusions that we have come to when reviewing IGCC projects in the United States. In addition to the information regarding IGCCs abroad, we reviewed a MIT report which likewise reinforces our conclusions that pulverized coal is the best technology for Big Stone II. Excerpts from the MIT report and the internet sites are provided in Attachment 3.

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<sup>1</sup> <http://www.netl.doe.gov/technologies/coalpower/gasification/database/GASIF2007.pdf>

Otter Tail also evaluated the emissions of the two electric utility operating IGCC units in the United States. *See* Attachment 4.

Attachment 4 shows the status of proposed IGCC facilities in the United States. Backup documentation is provided in Attachment 5. Because most of the proposed IGCCs have been cancelled or postponed, and none has yet to be built, much less operated, they are not “demonstrated” in any sense.

# Attachment 1

## Worldwide Electricity Producing IGCC Facilities

**Table 1 - Worldwide Electricity Producing IGCC Facilities (Excluding the U.S.)**

Facility Name	Owner	Country	Gasification Technology	Size (MW)	Fuel Type	Fuel Quantity (MT/d)	Start Date	Turbine
Vresova IGCC Plant	Sokolovska Uhelna, A.S.	Czech Republic	Lurgi Dry Ash Gasification Process	350	Lignite	2,040	1996	GE 9E
Kymijarvi ACFBG Plant	Lahden Lampovoima Oy	Finland	Foster Wheeler CFB Gasifier	42	Biomass	unspecified	1998	unspecified
Schwarze Pumpe Power / Methanol Plant	Sekundarrohstoff-Verwertungszeentrum Schwarze Pumpe Gmb	Germany	Lurgi Dry Ash Gasification Process	75	Municipal Solid Waste	1,500	1964	GE MS6001B
Karlsruhe Power Plant	unspecified	Germany	ThermoSelect Gasification Process	13	Municipal Solid Waste	900	1999	unspecified
Sanghi IGCC Plant	IBIL Energy Systems Ltd. (IES)	India	GTI U-GAS Gasification Process	53	Lignite	350	2002	GE 6B
ISAB Energy IGCC Project	ISAB Energy	Italy	GE Gasification Technology	512	ROSE (residuum oil supercritical extraction) Asphalt	3,168	1999	Siemens / Ansaldo
SARLUX IGCC Project	SARLUX slr	Italy	GE Gasification Technology	551	Visbreaker residue (petroleum refining)	3,545	2000	GE
api Energia S.p.A. IGCC Plant	api Energia S.p.A.	Italy	GE Gasification Technology	287	Visbreaker residue (petroleum refining)	1,440	2001	ABB Lummus Global 13E2

Facility Name	Owner	Country	Gasification Technology	Size (MW)	Fuel Type	Fuel Quantity (MT/d)	Start Date	Turbine
Negishi IGCC	Nippon Petroleum Refining Co.	Japan	GE Gasification Technology	342	Visbreaker residue (petroleum refining)	2,000	2003	Mitsubishi 701F
Buggenum IGCC Plant	Nuon Power Buggenum	Netherlands	Shell Gasification Process	253	bituminous coal	2,000	1994	Siemens/ KWU V94.2
Chawan IGCC Plant	Esso Singapore Pty. Ltd.	Singapore	GE Gasification Technology	173	residual oil	924	2001	GE 6FA
Puertollano GCC Plant	Elcogas SA	Spain	Krupp Koppers PRENFLO Gasification Technology	335	coal & petcoke	2,600	1997	Siemens/ KWU V94.3
Varnamo IGCC Demonstration Plant	Sydskraft AB	Sweden	Foster Wheeler CFB Gasifier	6	biomass	55	1993	Alstom UK Typhoon

NOTE – Information in the table above was obtained from the NETL 2007 Gasification Database – Active and Planned Commercial Gasification Plants.  
<http://www.netl.doe.gov/technologies/coalpower/gasification/database/GASIF2007.pdf>

**Table 2 - Worldwide Coal-Based IGCC Facilities Selling Electricity to the Grid (Excluding the U.S.)**

Facility Name	Owner	Country	Gasification Technology	Size (MW)	Fuel Type*	Fuel Heat Capacity (Btu/lb)*	Fuel Quantity (MT/d)	Start Date	Turbine
Buggenum IGCC Plant	Nuon Power Buggenum	Netherlands	Shell Gasification Process	253	Queensland Coal / <30% biomass	10,920 Btu/lb	2,000	1994	Siemens/ KWU V94.2
Puertollano GCC Plant	Elcogas SA	Spain	Krupp Koppers PRENFLO Gasification Technology	335	50% High Ash Coal / 50% Petcoke	10,230 Btu/lb	2,600	1997	Siemens/ KWU V94.3

\* from Nykomb Synergetics

## Attachment 2

### EMISSIONS FROM OPERATING IGCC PLANTS

#### TECO POLK

	Total	Total		NOx	SO2	CO2
	Actual	Potential	Percent	Emissions	Emissions	Emissions
	BTU's	BTU's	Capacity	(lbs/mmBtu)	(lbs/mmBtu)	(lbs/mmBtu)
	(mmBtu)	(mmBtu)				
January	1,250,289	1,305,720	96%	0.061	0.159	262.101
February	1,166,360	1,179,360	99%	0.071	0.139	256.401
March	1,211,655	1,305,720	93%	0.062	0.140	259.381
April	461,406	1,263,600	37%	0.051	0.124	263.281
May	128,837	1,305,720	10%	0.086	0.117	249.923
June	1,282,007	1,263,600	101%	0.053	0.116	260.525
July	1,159,189	1,305,720	89%	0.053	0.116	257.560
August	1,340,072	1,305,720	103%	0.048	0.131	263.340
September	1,155,012	1,263,600	91%	0.058	0.153	262.679
October	912,590	1,305,720	70%	0.059	0.131	254.660
November	1,169,522	1,263,600	93%	0.061	0.157	261.537
December	1,228,542	1,305,720	94%	0.052	0.129	262.508
<b>TOTAL</b>	<b>12,465,482</b>	<b>15,373,800</b>	<b>81%</b>	<b>0.058</b>	<b>0.136</b>	<b>260.266</b>

USEPA Clean Air Markets - Data and Maps Website

[http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.time\\_frame&EQW\\_fuseaction=emissions.time\\_frame&EQW\\_criteria\\_fuseaction=emissions.time\\_frame&EQW\\_tabMode=2&EQW\\_datasetSelection=Unit+Level+Emissions&EQW\\_menuSelection](http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.time_frame&EQW_fuseaction=emissions.time_frame&EQW_criteria_fuseaction=emissions.time_frame&EQW_tabMode=2&EQW_datasetSelection=Unit+Level+Emissions&EQW_menuSelection)



## DUKE ENERGY - WABASH

	<b>Total Actual BTU's (mmBtu)</b>	<b>Total Potential BTU's (mmBtu)</b>		<b>NOx Emissions (lbs/mmBtu)</b>	<b>SO2 Emissions (lbs/mmBtu)</b>	<b>CO2 Emissions (lbs/mmBtu)</b>
			<b>Percent Capacity</b>			
January	1,021,893	1,271,496	80%	0.071	0.088	264.750
February	1,343,302	1,148,448	117%	0.070	0.078	266.873
March	912,264	1,271,496	72%	0.064	0.063	263.403
April	1,078,770	1,230,480	88%	0.072	0.086	262.214
May	564,260	1,271,496	44%	0.074	0.117	256.331
June	1,099,244	1,230,480	89%	0.065	0.089	266.856
July	531,920	1,271,496	42%	0.071	0.117	222.579
August	1,171,089	1,271,496	92%	0.060	0.095	266.872
September	861,830	1,230,480	70%	0.064	0.093	264.964
October	639,900	1,271,496	50%	0.054	0.082	266.762
November	0	1,230,480	0%	0.000	0.000	0.000
December	0	1,271,496	0%	0.000	0.000	0.000
<b>TOTAL</b>	<b>9,224,471</b>	<b>14,970,840</b>	<b>62%</b>	<b>0.066</b>	<b>0.097</b>	<b>262.362</b>

USEPA Clean Air Markets - Data and Maps Website

[http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.time\\_frame&EQW\\_fuseaction=emissions.time\\_frame&EQW\\_criteria\\_fuseaction=emissions.time\\_frame&EQW\\_tabMode=2&EQW\\_datasetSelection=Unit+Level+Emissions&EQW\\_menuSelection](http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.time_frame&EQW_fuseaction=emissions.time_frame&EQW_criteria_fuseaction=emissions.time_frame&EQW_tabMode=2&EQW_datasetSelection=Unit+Level+Emissions&EQW_menuSelection)



# Unit ARP Emissions Report February 6, 2008

Your query will return data for 3 facilities and 12 units.

You specified: Year(s): 2006 Program(s): ARP Facility: H L Spurlock, Polk, Wabash River Gen Station

State	Facility Name	Facility ID (ORISPL)	Unit ID	Associated Stacks	Year	Program (s)	Operating Time	# of Months Reported	SO <sub>2</sub> Tons	Avg. NO <sub>x</sub> Rate (lb/mmBtu)	NO <sub>x</sub> Tons	CO <sub>2</sub> Tons	Heat Input (mmBtu)
FL	Polk	7242	**1		2006	ARP	6,960	12	916.8	0.06	385.8	1,622,170.3	12,465,482
FL	Polk	7242	**2		2006	ARP	792	12	0.4	0.05	16.0	54,857.9	920,512
FL	Polk	7242	**3		2006	ARP	781	12	0.3	0.05	17.1	55,119.3	926,984
IN	Wabash River Gen Station	1010	1	MS0001, MS0002, MS0003, MS0004, MS0005	2006	ARP	6,160	12	434.8	0.07	324.6	1,210,077.2	9,224,471
IN	Wabash River Gen Station	1010	2	CS0005	2006	ARP	7,051	12	6,825.6	0.37	964.6	522,627.1	5,093,836
IN	Wabash River Gen Station	1010	3	CS0005	2006	ARP	8,072	12	7,383.8	0.37	1,054.7	566,934.9	5,525,682
IN	Wabash River Gen Station	1010	4	CS0005	2006	ARP	8,315	12	7,965.4	0.37	1,129.0	613,587.7	5,980,388
IN	Wabash River Gen Station	1010	5	CS0005	2006	ARP	7,845	12	8,301.8	0.37	1,172.4	637,858.6	6,216,947
IN	Wabash River Gen Station	1010	6	CS0005	2006	ARP	7,798	12	27,881.9	0.36	3,806.8	2,157,578.2	21,029,025
KY	H L Spurlock	6041	1		2006	ARP	8,457	12	15,707.3	0.32	3,520.0	2,190,849.1	21,353,286
KY	H L	6041	2		2006	ARP	8,587	12	22,075.2	0.19	3,880.5	4,217,286.8	41,104,151

260 lbs CO<sub>2</sub>/MMBtu

262 lbs CO<sub>2</sub>/MMBtu

	Spurlock												
KY	H L Spurlock	6041	3		2006	ARP	6,800	12	1,094.2	0.09	724.0	1,696,925.6	16,539,220
Total									98,587.6		16,997.6	15,545,872.7	146,379,984

205 lbs CO<sub>2</sub>/year

## Attachment 3

### Excerpts on International IGCC Projects

“The capital costs of IGCC plants are significantly greater than traditional coal-fired power. Consequently there are only four international IGCC plants currently delivering electricity into a grid, and none employ carbon capture and storage.”

***New Directions For Australia's Coal Industry, The National Clean Coal Initiative*** ([http://www.alp.org.au/download/now/new directions for australias coal industry.pdf](http://www.alp.org.au/download/now/new%20directions%20for%20australias%20coal%20industry.pdf))

“The SEP/Demkolec (Buggenum) project started operations in early 1994. The tight integration has led to some operational sensitivities and complexities, leading SEP to recommend only partial integration for future installations. The main problem encountered in the early years of operation at the Buggenum plant (also later encountered at Puertollano) has been combustion-induced vibrations and overheating in the gas turbine combustors. Design changes made in early 1997 have markedly improved the vibration problem, and since that time several long runs have been conducted, with an availability of over 80 percent in each quarter since the third-quarter of 1997 (with the exception of the second quarters when the required annual inspection is conducted). In the third- and fourth-quarters of 1998, the Gasification Island was in continuous operation for over 2,000 hours. The Shell gasifier has generally performed well and has achieved its design cold gas efficiency.

In summary, these demonstration plants show that IGCC systems can provide power at higher efficiency than pulverized coal plants, with significantly lower air emissions and a more benign solid byproduct. While the reliability/availability of these units has improved since they were first brought on-line, they are not yet operating at commercially acceptable availability levels (only 56 to 61 percent in 1998). Based on past experience in the development of new technologies, and assuming continued support by the various government and private parties involved, it is reasonable to expect that the remaining problems will be solved within the next 5 years.”

***EPRI Finds Buggenum The Most Efficient Operating Large IGCC Plant, J.E. Sinor Consultants Inc.*** <http://edj.net/sinor/sfr4-00a7.html>. Even after 10 years, these facilities are not above the necessary 90% reliability threshold.

There is a desire to partly convert the Buggenum IGCC facility to biomass gasification. The stakeholders are interested in sustainable power production, and the conversion to biomass will help The Netherlands meet its Kyoto commitment. NUON sees business opportunities for biomass (and green power) in Europe, though the speaker cautioned the Americans in the audience “do not try this at home.” His comment reflects the significant government subsidy provided for biomass use – about 5 cents per kWh of electricity. The overall investment associated with the switch to co-gasification on biomass appears to be about 20 million euros.

***Environmental Benefits of IGCC Coal Power Plant: A Technology Comparison panel presentation***, ASME Turbo Expo, Amsterdam, The Netherlands, June 2-6, 2002.

<http://courses.washington.edu/mengr430/au05/handouts/igcc.pdf>

## Attachment 4

Status of Recently Proposed/Permitted IGCC Projects

### Status of Recently Proposed/Permitted IGCC Projects

FACILITY	STATUS
<b>CANCELLED/ABANDONED/POSTPONED</b>	
Southern Co./Orlando Utilities Stanton Energy Facility (Florida)	Project discontinued due to continuing uncertainty surrounding potential state regulations relating to greenhouse gas emissions  ( <a href="http://pressroom-publisher.southerncompany.com/soco/soco132.html">http://pressroom-publisher.southerncompany.com/soco/soco132.html</a> )
TECO Polk 6 (Florida)	Project discontinued due to continuing uncertainty surrounding potential state regulations relating to greenhouse gas emissions  ( <a href="http://thefraserdomain.typepad.com/energy/2007/10/teco-cancels-ig.html">http://thefraserdomain.typepad.com/energy/2007/10/teco-cancels-ig.html</a> )
Tondu (Texas)	Cancelled due to high cost projections and lack of performance guarantees  ( <a href="http://uk.reuters.com/article/oilRpt/idUKN1526955320070615">http://uk.reuters.com/article/oilRpt/idUKN1526955320070615</a> )
Southwestern Power Group - Bowie (Arizona)	Converted to natural gas project due to high cost projections and uncertainty over greenhouse gas regulation  ( <a href="http://www.azstarnet.com/sn/printDS/199452">http://www.azstarnet.com/sn/printDS/199452</a> )
Excel (Colorado)	Postponed due to cost concerns  ( <a href="http://pepei.pennnet.com/display_article/310790/6/ARTCL/Display/none/1/Xcel--Energy-delays-600-MW-IGCC-plant/">http://pepei.pennnet.com/display_article/310790/6/ARTCL/Display/none/1/Xcel--Energy-delays-600-MW-IGCC-plant/</a> )
Kentucky Pioneer (Kentucky)	Permit Expired  E-Mail from: Andrews, Diana (EPPS DEEP DAN) [mailto: Diana.Andrews@ky.gov]
Steelhead (Illinois)	Abandoned  <i>See NOTE below table</i>
<b>ADVERSE DETERMINATIONS</b>	
Energy Northwest - Pacific Mountain Energy Center (Washington)	Energy Facility Site Evaluation Counsel placed on hold because of greenhouse gas emissions
WACO Elm Road Generating Station (Wisconsin)	PSD denied Certificate of Public Convenience and Necessity
Twin River Energy Center (Maine)	Local community rejected necessary change to zoning ordinance

IN THE PERMITTING PROCESS	
Duke Energy (Indiana)	Draft Air Permit Approved by Indiana URIC
Excelsior - Masada Energy Project (Minnesota)	PUC declared it an "innovative energy project" Draft ELIS in public comment
APE - Great Bend (Ohio)	PUC approved recovery of preconstruction costs
APE - Mountaineer (West Virginia)	Applications pending
PERMITTED	
Error - Christian County (Illinois)	On appeal at EAB by Sierra Club over CO2 emissions
Error - Cash Creek (Kentucky)	Permit Issued Nov. 30, 2007
Lima Energy (Ohio)	Construction delays have forced Lima to ask for an extension to its air permit

NOTE: Steelhead is on IEPA's list of 2006 active permits and absent on the 2007 list. The project is technically still open; however, according to IEPA, the company has terminated activity on the project.  
<http://www.epa.state.il.us/air/permits/electric/index.html#archives>



## Attachment 5

Press Releases Concerning Proposed IGCC Projects

# News



Media Contact:

Title:

Phone Number:

Email:

[Southern Company Media Relations](mailto:SouthernCompanyMediaRelations@sc.com)  
[www.southerncompany.com](http://www.southerncompany.com)

November 19, 2007

## Plans for Orlando Clean Coal Plant Discontinued

### Construction of Natural Gas, Combined Cycle Plant to Proceed as Scheduled

ATLANTA – Continuing uncertainty surrounding potential state regulations relating to greenhouse gas emissions has resulted in the cancellation of a 285-megawatt integrated gasification combined cycle (IGCC) facility at the Stanton Energy Center near Orlando, Fla. Formal action to terminate construction was taken by an executive committee, composed of representatives from the Orlando Utilities Commission (OUC) and Southern Power, a subsidiary of Atlanta-based Southern Company.

Construction of a gas-fired combined cycle generating facility will proceed as originally planned.

Southern Company remains confident in its coal gasification technology and believes it has the potential to be among the cleanest, most efficient coal-based generation options available for the foreseeable future.

The IGCC process turns coal into gas for generating electricity, while significantly reducing emissions of sulfur dioxide, nitrogen oxides and mercury. IGCC plants use state-of-the-art emission controls, showcasing the most efficient coal-fired power technology in the world.


With 4.3 million customers and more than 42,000 megawatts of generating capacity, Atlanta-based Southern Company (NYSE: SO) is the premier energy company serving the Southeast, one of America's fastest-growing regions. A leading U.S. producer of electricity, Southern Company owns electric utilities in four states and a growing competitive generation company, as well as fiber optics and wireless communications. Southern Company brands are known for excellent customer service, high reliability and retail electric prices that are significantly below the national average. Southern Company has been listed the top ranking U.S. electric service provider in customer satisfaction for eight consecutive years by the American Customer Satisfaction Index (ACSI).

# The Energy Blog

The Energy Revolution has begun and will change your lifestyle

October 05, 2007

## TECO Cancels IGCC Power Plant

 Tampa Electric yesterday announced that it no longer plans to meet its 2013 need for baseload generation through the use of integrated gasification combined-cycle technology, or IGCC. Primary drivers of the decision announced today include continued uncertainty related to carbon dioxide (CO2) regulations, particularly capture and sequestration issues, and the potential for related project cost increases. Because of the economic risk of these factors to customers and investors, the company believes it should not proceed with an IGCC project at this time.

The company remains steadfast in its support of IGCC as a critical component of future fuel diversity in Florida and the nation, and believes the technology is the most environmentally responsible way to utilize coal, an affordable, abundant and domestically produced fuel. Tampa Electric is recognized as the world leader in the production of electricity from IGCC. The company also believes that IGCC technology offers the best platform to capture and then sequester CO2. Once public policy issues regarding long-term sequestration are resolved, demonstration projects can be conducted that will lead to a better understanding of the science, technologies and economics of sequestration.

*"We believe there is a role for IGCC in Tampa Electric's future generation plans, but with the uncertainty of carbon capture and sequestration regulations being discussed at the federal and state levels, the timing is not right to utilize it for a baseload facility needed by 2013. We are not prepared to expose our customers and shareholders to that risk."* - President Chuck Black

## **Tondu seeks natgas unit, steps back from Texas IGCC**

Fri Jun 15, 2007 5:54pm BST

NEW YORK, June 15 (Reuters) - Tondu Corp., of Houston, is opting for now to build a natural gas-fired power plant near Corpus Christi, Texas, instead of a proposed 600 MW integrated gasification combined cycle unit because of the high cost of the IGCC technology, Chief Executive Joe Tondu said Friday.

"I could not get people to pay what I would have to charge for power from an IGCC plant. But if I build a natural gas plant, I would have several buyers," Tondu said.

The CEO said his company decided about a week ago to modify the application with Texas regulators to start with a simple cycle natural gas plant of about 125 MW at the Nueces site that could later be expanded and converted into a combined cycle natural gas plant and if economically feasible into an IGCC in the future.

IGCC technology, a variation of a natural gas-fired combined cycle plant, uses coal or petroleum-derived gas in a gas turbine to generate electricity and then uses the hot gas leaving the turbine to heat water to produce steam to power a steam turbine and generate more power.

He said the 600 MW IGCC would have cost about \$1.5 billion to build, or about \$2,500 per kilowatt, versus just \$300 to \$500 per kilowatt for a simple-cycle natural gas unit.

Moreover, he said he could have the natural gas unit in service as early as next spring. An IGCC plant would likely take more than five years to permit and build, electricity traders said.

Other companies, including NRG Energy Inc. (NRG.N: Quote, Profile, Research), TXU Corp. TXU.N, Hutton Energy -- with financial backing from Goldman Sachs Group Inc.'s (GS.N: Quote, Profile, Research) Cogentrix Energy subsidiary -- and NuCoastal Power Group are also looking at developing IGCC projects in Texas, a state that needs additional electric generation to meet growing demand.

IGCC technology allows for the separation of the pollutants currently regulated in the United States -- nitrogen oxide, sulfur dioxide and mercury -- from the gas before burning it, and in the future may allow for the capture of carbon dioxide, a greenhouse gas.

Tondu developed solid fuel power plants in Michigan and British Columbia in the early 1990s that burn coal, wood waste, petroleum coke and tire derived fuel. The company sold the British Columbia facility but continues to own a stake in the 60 MW Filer City station in Michigan.

Published: 09.03.2007

## Facing criticism, power firm drops plan to burn coal at proposed plant

By Bob Christie

THE ASSOCIATED PRESS

The developers of a proposed coal-fired power plant in southeastern Arizona that has drawn criticism from neighbors have decided the facility will instead burn natural gas. Southwestern Power Group announced the decision for its Bowie Power Station in a news release sent late Friday. Company officials weren't available Saturday. The announcement brought a swift reaction from Cochise County Supervisor Paul Newman, who held a Town Hall meeting Aug. 17 that brought together company officials, plant supporters and a host of opponents.

"That's a huge environmental victory for Cochise County and the state of Arizona," Newman, a former state legislator, said Saturday. "I've been in a state of disbelief about it since yesterday afternoon when I was informed."

The Bowie facility was approved by the Arizona Corporation Commission in 2002 as a natural gas-fired plant with two 500-megawatt generators. After the first unit was built, the private plant would have been required to also build some solar power units, and pay into a fund to compensate nearby growers if they are harmed by the increase in groundwater pumping the plant requires. But soaring gas prices and questionable supplies forced the company to change the power source to coal.

Southwestern then proposed a 600-megawatt plant using coal gasification, a new technology that cuts emissions from coal plants by a considerable amount, although not to the levels of a modern natural gas-fired plant. A 600-megawatt plant would produce enough electricity for about 600,000 homes. The company also proposed an experimental project to sequester some of the plant's carbon dioxide emissions, a byproduct of combustion considered responsible for global warming.

The coal proposal drew complaints from Bowie and Willcox residents worried about pollution, noise, water use and lifestyle changes the plant will bring to the area.

Coal gasification is an expensive new technology, and proposed coal plants of all types are facing an increasingly uncertain future as the debate over their greenhouse-gas emissions heats up.

All that was apparently too much for Southwestern Power.

"We're making this decision for (a) combination of reasons," the Phoenix company's general manager, David Getts, said in a statement. "Market economics, regulatory uncertainty, and public understanding are all factors that helped us come to this decision."

The Cochise County Planning and Zoning Commission approved the coal-plant site two miles outside Bowie in March after a sometimes-heated public meeting, but county supervisors had yet to give final approval.

The plant did have many supporters, some citing the job creation and taxes it would bring to the county.

But many people in Cochise County weren't buying it, said Newman, who noted that he had not yet decided if he would have voted to approve the coal plant.

"I do think that the energy industry in the West should take notice," Newman said. "The citizens don't want power plants that add to this greenhouse effect. We've reached a tipping point."

"This is a natural-resources area, and we understand that," Newman said. "But in this day and age we don't see why we need to bring dirty coal down from Montana and Wyoming to southwestern Arizona and ruin our beautiful vistas."

Southwestern officials said the gas-fired plant has the best chance of being permitted and built in a reasonable time.

The gas plant has the required air permits and Corporation Commission and county approval, the company said. It expects the remaining permits to be granted by early next year and said construction will begin as soon as possible.

### On the Net:

Bowie Power Station: [www.BowiePower.com](http://www.BowiePower.com)  
Southwestern Power Group: [www.southwesternpower.com/](http://www.southwesternpower.com/)  
Cochise County: [www.co.cochise.az.us](http://www.co.cochise.az.us)

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Arizona Corporation Commission:  
[www.cc.state.az.us/](http://www.cc.state.az.us/)

**Xcel Energy delays 600-MW IGCC plant**

1 November 2007 -- Xcel Energy Inc. is delaying plans for a 600-MW IGCC power plant in Colorado because of cost concerns and a desire to find project partners. Spokeswoman Ethnie Groves was quoted as saying, "We're not abandoning the project." Xcel still has "confidence in the technology" for IGCC, she said.

Xcel may not propose the plant to Colorado regulators until 2009 or later. Xcel also pushed back the planned completion date to 2016 and will continue to study IGCC. The delay was reported Tuesday by the Denver Business Journal, which cited comments made by Chief Executive Officer Richard Kelly at a conference and said the plant could cost more than \$1 billion.

Teco Energy Inc., based in Tampa, Fla., last month said it wasn't moving ahead with plans for a \$2 billion IGCC unit because of uncertainty over possible emissions regulations and the potential for rising construction costs.

**Find this article at:**

[http://pepei.pennnet.com/display\\_article/310790/6/ARTCL/Display/none/1/Xcel-Energy-delays-600-MW-IGCC-plant](http://pepei.pennnet.com/display_article/310790/6/ARTCL/Display/none/1/Xcel-Energy-delays-600-MW-IGCC-plant)

## Power-plant plan rejected; fails to meet emissions law

By Warren Cornwall

*Seattle Times environment reporter*

New power plants built to light Washington must limit their greenhouse-gas pollution, according to a ruling Tuesday that affirms a new direction for the state's pursuit of electricity.

In a critical first test of a new state law meant to block construction of power plants that spew climate-changing gases, a state panel soundly rejected plans for a 793-megawatt plant in Kalama, Cowlitz County, that would be fueled by coal or oil-refinery waste.

The decision by the Energy Facility Site Evaluation Council, which oversees power-plant permits, is a blow for Energy Northwest, the coalition of 20 Washington public utilities that wants to build the plant.

It's also among a string of recent setbacks for new polluting power plants nationwide — including ones in Florida, Kansas and Texas — as concerns rise about climate change.

"Burning coal for energy is a 19th-century answer to the problems that we have in front of us," said attorney Jan Hasselman, of Earthjustice, which represented environmental groups in challenging the Energy Northwest plan for Kalama. "We think that it is time to move on."

The state energy-facility council's strongly worded and unanimous ruling sided with the environmental groups and several state agencies. They all had argued that Energy Northwest essentially was trying to skirt a new state law.

That law, passed in the spring, requires new power plants to limit emissions of greenhouse gases, such as carbon dioxide, to the same levels of a high-efficiency, natural-gas power plant. Any plant puffing out more than that — such as a coal-fired plant — must capture the extra and find a way to store it permanently.

Energy Northwest claimed that the current state of technology limits its ability to store the greenhouse gases, so it promised that if it could build the plant, it would come up with a more detailed plan in the future.

But the energy council said sharply that Energy Northwest's approach "misses the mark by a wide margin."

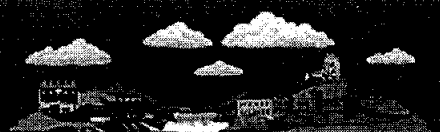
It said Energy Northwest was basically asking the council to overturn the new state law, which it can't do. Simply having "a plan to make a plan" wasn't adequate, the council said.

The council halted any further consideration of the application to build the plant.

Energy Northwest spokesman Gary Miller on Tuesday said the group needs time to review the decision before deciding on its next step. The group's leaders have previously said a requirement to capture the gases, called sequestration, could thwart the project.

Kim Schmanke, a spokeswoman for the state Department of Ecology, said the agency would work with Energy Northwest to find a solution. Ecology was among the opponents to the Energy Northwest plan for the project, as was the state Department of Community, Trade and Economic Development.

Meanwhile, the ruling could give a boost to a separate effort to build a coal-fueled power plant along the Columbia River near Wallula, Walla Walla County, in Eastern Washington.



## **Wiscasset rejects coal plant**

Wednesday, November 7, 2007

WISCASSET (AP) — Wiscasset voters have rejected ballot questions necessary for a \$1.5-billion coal gasification plant on the site of the former Maine Yankee plant.

Town Clerk Sandra Johnson says the pivotal vote was 868-707 against Question 2, which would have allowed the Twin River Energy Center to exceed the zone's height limit.

Twin River isn't throwing in the towel, however.

According to a spokesman, further studies are warranted because Tuesday's vote was so close.

Supporters say the proposed Twin River Energy Center would use gasification technology to transform coal and wood biomass into up to 700 megawatts of electricity and up to 9,000 barrels per day of diesel fuel.

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Information from: Portland Press Herald, <http://www.pressherald.com>



# Lima Energy

## From SourceWatch

Global Energy was founded in 1988 by Harry Graves, a former executive at Procter & Gamble. The Lima Energy plant will provide power to Procter & Gamble Co.'s plant in Lima, Ohio. The plant sits on a 63-acre site of the former Locomotive Works purchased from the City of Lima.<sup>[1]</sup>

Construction on the plant began in 2005; in Oct. 2006, Global Energy halted construction on the plant, but plans to resume construction once full financing is in place. However, delays have forced Global Energy to apply for an extension on its air permit from the Ohio EPA, and planned changes to the plant design mean that the proposed permit modification will trigger a new round of public notice and comments. In Jan. 2008, the Sierra Club filed suit against Lima Energy, charging that the company is moving ahead on the project without securing valid permits.<sup>[2]</sup>

## Contents

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- [2 Financing](#)
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- [4 Resources](#)
  - [4.1 References](#)
  - [4.2 Related SourceWatch Articles](#)
  - [4.3 External Links](#)

[\[edit\]](#)

## Project Details

**Sponsor:** Global Energy  
**Location:** Lima, OH  
**Capacity:** 600 MW  
**Type:** IGCC  
**Projected in service:** 2008  
**Status:** Oh hold

[\[edit\]](#)

## Financing

[\[edit\]](#)

## Citizen Groups

- [Ohio Sierra Club](#)

[\[edit\]](#)

## Resources

[\[edit\]](#)

## References

1. [↑ Lima Energy Company and Lima IGCC](#), Global Energy corporate website, accessed January 2008.
2. [↑ "Environmental Group Suing Lima Energy"](#), *Lima News*, January 12, 2008.

[\[edit\]](#)

## Related SourceWatch Articles

[\[edit\]](#)

## External Links

- National Energy Tech Lab, "[Tracking New Coal-Fired Power Plants: Coal's Resurgence in Electric Power Generation](#)", NETL, May 2007, page 18 (Pdf)
- Sierra Club, "[Stopping the Coal Rush](#)", Sierra Club, accessed December 2007. (This is a Sierra Club list of new coal plant proposals.)

## Blogs that mention this article

- [No reactions](#)

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Views

**See Excelsior Energy Website at:**

[http://www.excelsiorenergy.com/pdf/Press\\_Releases/110207\\_Excelsior\\_Statement.pdf](http://www.excelsiorenergy.com/pdf/Press_Releases/110207_Excelsior_Statement.pdf)

November 2, 2007

**Mesaba Energy Project Order Upheld by Public Utilities Commission**

On November 1, 2007, the Minnesota Public Utilities Commission upheld its August 30, 2007 order finding that the Mesaba Energy Project is an "innovative energy project" that has unique rights under Minnesota law designed to spur its development. The Commission's August 30 order finds it would not be in the public interest for Xcel Energy to sign the proposed power purchase agreement for 603MW of the plant's output, but instead requires the Project to continue power contract negotiations with Xcel and explore opportunities for other utilities in the State to share in the output from the Project.

The Mesaba Energy Project has become more critical to the national energy policy goal of commercializing the IGCC technology (integrated gasification combined-cycle, or "coal gasification") as other proposed IGCC plants nationwide have been put on hold or cancelled in favor of generation fueled by natural gas. National energy policy experts recognize that a massive increase in natural gas-fired power generation will drive up prices, create supply uncertainty and cause the country to become further dependent on the Middle East, northern Africa, Russia and other energy-rich countries for the supply of natural gas. In light of the recent cut-off of 30,000 home heating customers by one Twin Cities utility alone, and the fact that more than 1/3 of the natural gas utilities' customers are in default on their home heating bills, the impact of the switch from coal to natural gas to generate power will be felt acutely by consumers and industry.

IGCC allows the U.S. to avoid this dangerous new reliance on natural gas and to use our abundant Midwestern coal instead. The U.S. has recoverable coal that is the energy equivalent of about 1 trillion barrels of crude oil – comparable in energy content to all of the world's known oil reserves.

IGCC allows coal use in a new way so that its environmental impacts are minimized. Total emissions from the Mesaba Project are 2/3 less than the next best advanced coal alternative, and the project will remove 90% of the mercury from the coal. IGCC is also critical to any climate change policy. Delay of the first round of IGCC plants and the carbon capture and sequestration that they will demonstrate threatens our ability to address global warming. The Clean Air Task Force, a recognized national environmental advocate, calculates that if IGCC with carbon capture and sequestration is not widely commercially available in the next 15 years, it will be "game over" in terms of our ability to stabilize greenhouse gases. IGCC is acknowledged by policy makers across the political spectrum as mission-critical to any meaningful policy to address climate change.

Excelsior is committed to bringing the Mesaba Energy Project to fruition in order to make a significant contribution to our national energy security and the climate change equation.

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MAR 03 2008

AIR QUALITY  
PROGRAM

**Big Stone II**

## **Case-by-Case Mercury MACT**

Prepared for  
Big Stone II Co-owners

Big Stone City, South Dakota  
February 2008

## 1.0 INTRODUCTION

The Big Stone II Co-owners are proposing to construct Big Stone II, a new pulverized coal-fired boiler, and other equipment associated with the boiler, to meet the increasing capacity and energy requirements for the Co-owners. The Project would be located at the existing Big Stone Plant site, located in Grant County approximately 7.5 miles northeast of Milbank and 2.5 miles northwest of Big Stone City, South Dakota. The existing Big Stone Plant consists of Big Stone I, a cyclone-fired coal unit (450 MW).

Big Stone II falls within the category of electric generating unit (EGU). The new boiler will fire sub-bituminous coal to produce steam for a turbine generator with a maximum net power output of 600 MW. Actual unit capacity will be determined during detailed design of the plant. On-site construction of Big Stone II is scheduled to begin in spring of 2009, and commercial operation is scheduled mid-summer 2013. As an EGU, Big Stone II will emit hazardous air pollutants (HAPs).

## 2.0 REGULATORY BACKGROUND

In evaluating EGUs pursuant to Clean Air Act § 112(n), EPA determined that the HAP of concern from coal-fired EGUs is mercury. On March 15, 2005, EPA issued the Clean Air Mercury Rule (CAMR) to permanently cap and reduce mercury emissions from coal-fired power plants. CAMR established “standards of performance” limiting mercury emissions from new coal-fired power plants and created a market-based cap-and-trade program for new and existing plants to reduce nationwide utility emissions of mercury.

On February 8, 2008, the U.S. Court of Appeals for the District of Columbia Circuit issued a decision vacating CAMR. The court found that in adopting this rule, EPA had unlawfully delisted (removed) EGUs from regulation under Section 112 of the Clean Air Act, which invalidated the underlying basis for EPA to implement CAMR. The court’s decision vacating CAMR does not take legal effect until the court issues its mandate, which may not be for some time due to appeals of the decision. In the meantime, CAMR remains in effect but there is regulatory uncertainty as to requirements associated with mercury emissions for new units. Consequently, the Big Stone II Co-owners are requesting a “protective” CAA § 112(g) case-by-case MACT determination for mercury in the event that CAMR is ultimately vacated.

### 3.0 UNCONTROLLED HG EMISSIONS FROM BIG STONE II

Coal contains trace quantities of mercury that can be released when the coal is burned. The uncontrolled mercury emissions from Big Stone II based on the design fuel are calculated as follows:

Given:

- Big Stone II would have a maximum heat input of 6,000 MMBtu/hr, a maximum power output of 600 MW (net), and an expected power output of 650 MW (gross).
- The unit performance guarantee fuel, as received, has a mercury content of 8.4 lb/TBtu.

$$(8.4 \text{ lb Hg/TBtu}) \times (6,000 \text{ MMBtu/hr}) \times (8,760 \text{ hr/yr}) \times (\text{TBtu}/10^6 \text{ MMBtu}) = 441.5 \text{ lb/yr uncontrolled}$$

### 4.0 CONTROL OF MERCURY EMISSIONS

Mercury emissions from coal-fired boilers are generally controlled through co-benefit from the controls for nitrogen oxides (SCR), sulfur dioxides (wet flue-gas desulfurization) and particulate matter (fabric filter). These are the types of controls currently in use by the best controlled similar sources. To determine what the appropriate mercury MACT limit should be for Big Stone II, EPA's memo on case-by-case MACT, EPA's Integrated Planning Model, and EPA's 2004 proposed MACT for new sources were reviewed as discussed below.

#### 4.1 EPA's Memo on Case-by-Case MACT

On August 1, 2001, EPA issued a guidance memo entitled "Case-By-Case MACT for New Oil- and Coal-fired Electric Utility Steam Generating Units." (See Attachment A.) The memo presented a tool that EPA was providing to the States to use "in their evaluation of individual case-by-case determinations for these units."<sup>1</sup> The tool allowed permitting authorities and others to evaluate the impact on mercury emissions if certain parameters including type of coal, boiler, or pollution control device are known. The basis for the tool is the information gathered from the industry during calendar year 1999 on their plants, the coal they burned, and their mercury emissions (the "ICR"<sup>2</sup> data).

Although the tool is still available on EPA's website, the data upon which it is based is outdated and "does not include or represent any EPA determination of presumptive MACT, nor does it reflect any decision(s) by the Agency on MACT floors, subcategorization, or other aspects of the MACT standard."

<sup>1</sup> <http://www.epa.gov/ttn/atw/combust/utitox/uttoxpg.html#CASE>

<sup>2</sup> Information Collection Request

## 4.2 Integrated Planning Model

EPA's Integrated Planning Model (IPM) is the model that EPA uses to analyze the impact of air emissions policies on the U.S. electric power sector over a 20-year time horizon.<sup>3</sup> The EPA Base Case 2006 data are more relevant than the ICR data used as the basis for EPA's 2001 case-by-case MACT tool. Table 5.10 in Section 5 of the IPM documentation<sup>4</sup> provides mercury emission modification factors (EMF) for various boiler types, fuels, and controls. In Table 5.10, the EMF applicable to Big Stone II is 0.27 or 73% reduction achieved through co-benefit reduction of mercury when using selective catalytic reduction (SCR), fabric filter, and wet flue gas desulfurization (FGD) on sub-bituminous coal.

## 4.3 2004 Proposed Mercury MACT Rule

In 2004, EPA proposed a mercury MACT rule (the "MACT alternative") for new units.<sup>5</sup> The proposed rule provided a limit of 0.020 lb/GW hr (gross) for sub-bituminous coal combustion in new units based on co-benefit reduction from existing controls. This proposed new-unit MACT was abandoned in favor of CAMR. However, since CAMR may ultimately be vacated, the MACT Alternative is a defensible case-by-case MACT for the new Big Stone II.

<sup>3</sup> <http://www.epa.gov/airmarkets/progsregs/epa-ipm/#bc301>

<sup>4</sup> <http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/Section-5.pdf>

<sup>5</sup> 69 FR 4652

## 5.0 MACT CONCLUSION

The potential vacatur of CAMR has created uncertainty as to the appropriate manner to address mercury emissions from the proposed Big Stone II. Table 1 presents a summary of possible Hg limits that may be considered appropriate as the basis for a MACT determination in this case. Big Stone proposes a limit of 0.020 lb/GW hr (gross). Mercury from Big Stone II would then be limited to this value on a 12-month rolling average. Based on typical coal quality and 100% capacity factor, this would be equivalent to mercury emissions of approximately 114 lb/year.

Table 1: Possible Mercury Limits Estimates for Big Stone II

Basis	Limit (annual average)	Notes	Potential Hg Emitted (lb/yr)
Draft Permit	0.066 lb/GW hr	On Public Notice	347
CAMR	0.097 lb/GW hr	Potentially vacated	510
IPM EMF	73% reduction	Using SCR, fabric filter, and wet FGD on sub- bituminous coal in a PC boiler	119
MACT Alternative	0.020 lb/GW hr (gross)	Emission limit proposed by EPA as MACT for new coal-fired EGUs firing sub- bituminous coal. Subsequently replaced by CAMR	114



August 1, 2001

SUBJECT: Case-By-Case MACT for New Oil- and Coal-fired Electric Utility Steam Generating Units

FROM: John S. Seitz, Director  
Office of Air Quality Planning and Standards

TO: Regional Office Air Directors

The purpose of this memoranda is to clarify the applicability of the "case-by-case" maximum achievable control technology (MACT) provisions of Clean Air Act section 112(g) to oil- and coal-fired electric utility steam generating units. In addition, we are providing a tool that the States may find useful in their evaluation of individual case-by-case determinations for these units.

The EPA's regulations for case-by-case MACT, which were promulgated in 1996, are set out in 40 CFR, Part 63, Subpart B. Those regulations require case-by-case determinations of MACT by the Title V permitting authority for each major source of HAP which is constructed or reconstructed after the effective date of that permitting authority's section 112(g) program. For electric utility steam generating units, the case-by-case provisions contain an exemption from applicability "unless and until such time as these units are added to the source category list." On December 14, 2000, the EPA announced that it was adding coal- and oil-fired power plants to the section 112(c) list of sources (65 FR 79825; December 20, 2000). Therefore, each coal or oil-fired electric utility steam generating unit which is constructed or reconstructed will now be subject to the case-by-case provisions of the Act until the EPA promulgates a nationally applicable MACT standard to address hazardous air pollutants for this source category. The EPA expects to promulgate a final standard in December 2004.

We have developed a tool that the Title V permitting authorities may find useful in evaluating applications for a case-by-case MACT determination which are submitted by affected facilities within their jurisdictions. The tool will allow permitting authorities and others to evaluate the impact on mercury emissions if certain parameters including type of coal, boiler, or pollution control device are changed. The basis for the tool is the information gathered from the industry during calendar year 1999 on their plants, the coal they burned, and their mercury emissions. The tool has been provided to assist permitting authorities in making the required case-by-case determinations, but no permitting authority is required to utilize it for that purpose. The tool does not include or represent any EPA determination of presumptive MACT, nor does it reflect any decision(s) by the Agency on MACT floors, subcategorization, or other aspects of the MACT standard. The tool may be found at

<<http://www.epa.gov/ttn/uatw/combust/utitox/utoxpg.html>>.

Please note that the December 2000 decision to list coal- and oil-fired power plants does not apply to gas-fired electric utility steam generating units, thereby exempting them from future regulation as electric utility steam generating units under section 112. This exemption does not apply, however, to stationary combustion turbines based on our earlier determination in an interpretative rule<sup>1</sup> that such turbines are not considered "electric utility steam generating units." Stationary combustion turbines are included on the list of source categories under section 112(c) of the Act and the Emission Standards Division is currently developing MACT standards for this source category. Stationary combustion turbines are subject to separate case-by-case determinations under the interpretative rule noted above. Proposal of these MACT standards is anticipated in the near future, with promulgation following in 2002. These MACT standards will apply to all stationary combustion turbines regardless of their configuration, end use, or location.

This memorandum should fully clarify the need for all new oil- and coal-fired electric utility steam generating units to undergo case-by-case MACT determinations without further action by EPA. If questions should arise, however, please contact Mr. William Maxwell at (919) 541-5430.

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<sup>1</sup> 65 FR 34010; May 25, 2000